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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H01L 33/00	A3	(11) International Publication Number: WO 99/10936 (43) International Publication Date: 4 March 1999 (04.03.99)
(21) International Application Number: PCT/US98/17849 (22) International Filing Date: 28 August 1998 (28.08.98) (30) Priority Data: 08/920,409 29 August 1997 (29.08.97) US (63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application US 08/920,409 (CON) Filed on 29 July 1997 (29.07.97) (71) Applicant (for all designated States except US): CREE RESEARCH, INC. [US/US]; 4600 Silicon Drive, Durham, NC 27703 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): SLATER, David, B., Jr. [US/US]; 6304 Jarratt Cove, Raleigh, NC 27613 (US). NE- GLEY, Gerald, H. [US/US]; 3512 NC 86 S., Hillsborough, NC 27278 (US). EDMOND, John, Adam [US/US]; 206 W. Jules Verne Way, Cary, NC 27511 (US). (74) Agent: SUMMA, Philip; Suite 315, 13777 Ballantyne Corpo- ration Place, Charlotte, NC 28277 (US).		(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 14 May 1999 (14.05.99)
(54) Title: ROBUST GROUP III NITRIDE LIGHT EMITTING DIODE FOR HIGH RELIABILITY IN STANDARD APPLICATIONS		
(57) Abstract A physically robust light emitting diode is disclosed that offers high-reliability in standard packaging and that will withstand high temperature and high humidity conditions. The diode comprises a Group III nitride heterojunction diode with a p-type Group III nitride contact layer, and ohmic contact to the p-type contact layer, and a passivation layer on the ohmic contact. The diode is characterized in that it will emit at least 50 % of its original optical power and remain substantially unchanged in operating voltage after operating for at least 1000 hours at 10 milliamps in an environment of 85 % relative humidity at a temperature of 85 °C. An LED lamp incorporating the diode is also disclosed.		

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INTERNATIONAL SEARCH REPORT

national Application No

PCT/US 98/17849

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H01L33/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 622 858 A (NICHIA KAGAKU KOGYO KK) 2 November 1994 cited in the application see page 6, line 4-47 see page 9, line 20-37 see page 17, line 8-10 ---	1-17
A	WO 96 24167 A (ADVANCED TECH MATERIALS ;REDWING JOAN (US); TISCHLER MICHAEL A (US) 8 August 1996 see page 23, line 1-30 see page 29, line 16-28; figure 7 ---	1-7, 13, 15-17
A	US 5 523 589 A (EDMOND JOHN A ET AL) 4 June 1996 see column 5, line 56-62 see column 7, line 44-52 see column 8, line 23-32 ---	1-3, 7, 8, 13, 17
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Date of the actual completion of the international search

8 March 1999

Date of mailing of the international search report

15/03/1999

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